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China, Peoples Republic of

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Corn Production Estimates

2007

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Report Highlights:

As farmers discount the marginal cost of labor and land, the key factor in determining production are out-of-pocket expenses, or material inputs and services. These are an estimated \$63/MT providing approximately \$65/MT to the farmer based on a farm gate price of \$135/MT. With an average farm size of 0.25 Ha, and a yield of 5.12 MT/Ha, the average on farm income from corn is \$175/yr or almost \$83/yr after out-of-pocket expenses.

Includes PSD Changes: No
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Summary

As reported in the Grain and Feed Annual the principal limit to expanded corn production is land limitations and constraints on the use of technology (no biotech corn corps have been approved for planting). The cost of producing corn, including imputed labor and land costs is estimated at \$140/MT. However, this overstates the imputed costs of labor and land and suggests that corn producers in CY2005 had an averaged net loss of \$4.71/MT.

As farmers discount the marginal cost of labor and land, the key factor in determining production are out-of-pocket expenses, or material inputs and services. These are an estimated \$63/MT providing approximately \$65/MT to the farmer based on a farm gate price of \$135/MT. While farm size varies widely, Post estimates the average farm size of 0.25 Ha. With yield of 5.12 MT/Ha, the average on farm income from corn is \$175/yr or almost \$83/yr after out-of-pocket expenses.

Corn producers relied on direct payments and subsidies of \$7.54 to offset losses. Average costs for corn production in 2005 were \$62.28/MT for material input and service, \$52.29/MT for labor, and \$24.22/MT for land. Corn's land and labor costs made up larger percentages of total costs than those for grain. The ratios of individual costs by MT for corn were 45% for material input and service, 38% for labor, and 17% for land. See table 1.

Price and Production Costs OK While Yield and Direct Payment Data Questionable

China's NDRC (National Development and Reform Commission) reported in November 2006 national survey results for corn production in 2005. The results included national averages of corn yield, direct payments for corn production, and corn prices and production costs, 6.33 MT/Ha, \$2.40/MT, \$137/MT, and \$113/MT, respectively. While anything to do with statistics in China is questionable, Post has opted to accept NDRC's reported cost and price data. As detailed below, Post estimates that average corn yield was lower and average direct payments were higher than reported by NDRC.

Post estimates yield is 5.12 MT/Ha and subsidies, including direct payments, were \$7.54/MT. These work through to increase estimated production costs to \$140, including imputed labor and land costs. As discussed below, the marginal costs of both are opportunity costs, making out-of-pocket marginal costs closer to \$63/MT.

The reported average corn yield per hectare in 2005 was 6.339 MT/Ha. Post analysis concludes that actual yield was significantly lower than was reported due to the exclusion of 29% of less productive areas and the overcompensation in adjustments for unreported acreage (black lands). Post estimates that actual 2005 yield was 5.12 MT/Ha based on revised production estimates of 135 MMT over a planted area of 26.358 million Ha (see table 1 in GAIN report CH7015). Further, Post estimates corn yield for CY2007 to be 5.26 MT/Ha, well below the reported 2005 yield.

The survey included 60,000 rural households in 1,553 counties, accounting for 70.59% of the approximately 2,200 counties in China. Areas not surveyed by the NDRC are considered to have much lower yields.

Productive Corn Areas Dominate Overall Output

Post estimates the average national yield for corn is 5.12 MT/Ha, based on previous Post analysis of average national corn production output and acreage. The NDRC's average national yield for corn was 6.339 MT/Ha for the 13 provinces.

Major grain producers for corn, wheat, and rice are concentrated in 13 provinces, totaling nearly 80% of China's output of commercial grains. As an example, the crop survey indicated that corn farmers in Jilin province, an exclusive corn-producing area and one of the provinces surveyed, had an average corn yield of 6.49 MT/Ha. The remainder is produced in more marginal areas and is less productive, thus bringing down the average national yield.

Direct Payments: Higher than Reported but Not Enough to Offset Losses

Post estimates direct payments for corn producers averaged \$2.98/MT in 2005 - 24% higher than the reported average. Based on this figure, direct payments alone do not offset corn losses. Corn producers must rely on further domestic support to recoup costs.

The NDRC reported that the average direct payment to grain producers was \$2.40/MT in 2005 and \$3.00/MT in 2004 (GAIN CH7015). Unlike yields, whose averages come from 13 provinces where yields are high, support numbers are collected nationwide and vary considerably by region. For example, based on survey data, corn farmers in Jilin province received an average direct payment of \$9.00/MT in 2005 - well above the reported average.

Average direct support payments for commercial grains is difficult to determine because the program for corn is relatively new, there are differences in the implementation metric (e.g. production value, quantity) used at the provincial level, and where metrics like yield are used, the lack of reliable data on these numbers complicate matters. Indirect support, including seeds support, transportation subsidies, and long-term investments such as agricultural machinery, further complicate analysis.

Seed Subsidy Comes in Two Forms

Implementation varies by commodity and province but generally falls into two categories: direct payments or discounted seeds. As a direct payment, it is an income support mechanism where the farmer is provided an average \$4.46/MT to purchase seed. What the farmer actually does with the payment is not monitored.

Alternatively, the subsidy is provided for farmers to purchase high quality seed at commodity prices. The subsidy is approximately \$3.67/MT and may take the form of a payment to the seed company to provide a specific type of seed at commodity prices or a reimbursement to the farmer for seed purchased.

Transportation Subsidy and Export Support Add to Domestic Support

Northern corn producers have succeeded in gaining export support (GAIN CH7018) and transportation subsidies. Grains transported by rail are exempt from a RMB 0.033 per ton per kilometer "construction fee" charged to other products transported domestically.

NDRC: Income from Corn Comparable to Soybeans – Short of Wheat and Rice

Using NDRC's 2005 data, corn had a higher return than soybean. Before average subsidies are factored in, corn provided a higher net profit than soybeans by \$12.19/MT. This spread is attributable to soybean's low yield, limited crop rotation, and the disparate impact of hand planting and hand picking on soybeans. See table 3.

Also using officially reported data, corn is less profitable per MT than rice and wheat. Corn does not compete with rice and wheat for land and, thus, however. Previous reports had aggregated costs and net profits into a single grain category (GAIN CH7015). When

segregated out, corn had a lower relative farm gate price (by \$34.43/MT) and a lower net profit (by \$15.79/MT). See table 2.

Land and Labor Costs are Entangled with Larger Policy Issues

China's corn production is concentrated in the northeast region and has higher imputed labor and land costs. In addition to being difficult to determine, it is out of pocket expenses (not imputed land and labor costs that principally guide on farm production decisions. In the case of labor, the opportunity costs for labor in the countryside is *de minimus*, requiring laborers to migrate to the city for meaningful income. While demand for migrant labor is in high demand in urban areas, Chinese government policies limit mobility. Informal estimates are there are 100 million migrant workers and those that do migrate receive higher incomes.

In the case of land, the state holds property to all land, so determining land costs is also made difficult. There are three basic types of land rights: land held by the state and farmed as collectives, land given to farmers based on family size; and land provided to farmers (also based on one's status in the town or village) but for a fee. Generally, the community must approve land transfers, so there is limited land transferability.

Table 1. Average Prices, Costs, and Domestic Support for Corn, 2005

Average Prices, Costs, and Domestic Support for Corn, 2005	
Post Estimates	
Yield (MT / Hectare)	5.120
(Dollar per MT, USD 1.00 = RMB 8.20 - 2005 Average)	
Wholesale Price (Consuming Regions)	\$157.17
Wholesale Price (Producing Regions)	140.48
Farm Gate Price	\$135.37
Total Costs	\$140.09
-Production Costs	115.87
--Material Input and Service	62.88
--Labor Costs	52.99
-Land Costs	24.22
Net Profit (FGP - Total Costs; excludes domestic support)	-\$4.71
Direct Payments	\$2.98
Seed Subsidy	\$4.46
China NDRC Reporting	
(Dollar Per Hectare, USD 1.00 = RMB 8.20 - 2005 Average)	
Production Value	\$891.93
Total Costs	\$717.24
-Production Costs	\$593.24
--Material Input and Service	\$321.94
--Labor Costs	\$271.30
-Land Costs	\$124.00
Direct Payments	\$15.24
Sources: China National Development and Reform Commission (NDRC), GAIN CH7015	

Table 2. Comparison of Officially Reported Data: Corn vs. Grain, 2005

China NDRC Reported Corn Data vs. Grains Data, 2005						
	Corn 2005			Grains 2005		
Yield (MT / Hectare)	6.339			5.897		
(Dollar per MT, USD 1.00 = RMB 8.20 - 2005 Average)						
Wholesale Price (Consuming Regions)	\$157.17			\$207.49		
Wholesale Price (Producing Regions)	140.48			196.00		
Farm Gate Price	\$135.37			\$169.80		
		% of Total Cost	% of FGP		% of Total Cost	% of FGP
Total Costs	\$113.15	100%	84%	\$131.78	100%	78%
-Production Costs	93.59	83%	69%	112.56	85%	66%
--Material Input and Service	50.79	45%	38%	65.62	50%	39%
--Labor Costs	42.80	38%	32%	46.94	36%	28%
-Land Costs	19.56	17%	14%	19.23	15%	11%
Net Profit (FGP - Total Costs)	\$22.23			\$38.02		
Direct Payments	\$2.40			\$3.39		
Sources: China National Development and Reform Commission (NDRC), GAIN CH7015, GAIN CH7018						

Table 3. Comparison of Officially Reported Data: Corn vs. Soybean, 2005

China NDRC Reported Corn Data vs. Soybean Data, 2005						
	Corn 2005			Soybeans 2005		
Yield (MT / Hectare)	6.339			1.700		
(Dollar per MT, USD 1.00 = RMB 8.20 - 2005 Average)						
Wholesale Price (Consuming Regions)	\$157.17	Wholesale Price		\$306.71		
Wholesale Price (Producing Regions)	\$139.32					
Farm Gate Price	\$135.37	Farm Gate Price		\$292.54		
		% of Total Cost	% of FGP		% of Total Cost	% of FGP
Total Costs	\$113.15	100%	84%	\$282.51	100%	97%
-Production Costs	93.59	83%	69%	--	--	--
--Material Input and Service	50.79	45%	38%	--	--	--
--Labor Costs	42.80	38%	32%	--	--	--
-Land Costs	19.56	17%	14%	--	--	--
Net Profit (FGP - Total Costs)	\$22.23			\$10.04		
Source: China National Development and Reform Commission (NDRC), GAIN CH6006, GAIN CH7012						